

NASA PROPAGATION INFORMATION CENTER

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Abstract

The NASA Propagation Information Center became formally operational in July 1988. It is located in the Department of Electrical and Computer Engineering of the University of Colorado at Boulder. The Center is several things: a communications medium for the Propagation program with the outside world, a mechanism for internal communication within the program, and an aid to management. The staff consists of Professors (adjunct and emeritus) Ernest K. Smith and Warren L. Flock, and Research Assistant Lisa Leonard.

Introduction

The NASA Science Review Panel of 1986 in its report made several points. Among them were these:

- The effectiveness of the program would be enhanced by cooperative projects with other organizations.
- There should be a mechanism for monitoring propagation research of other governmental and industrial organizations.
- NASA should take a leading role in the harmonizing and pooling of propagation data from relevant organizations by defining data acquisition/processing standards.
- The acclaimed Propagation Handbooks should be updated periodically, preferably in coordination with the 4-year CCIR cycle.
- The CCIR support activities should be maintained within the propagation program.
- NAPEX meetings are a good thing and should be continued.

These points provided some of the incentive for the creation of the NASA Propagation Information Center. It is fairly modest in scope financially. The two co-directors account for one quarter of a man year between them and our secretary cum research assistant is half time during the school year, and somewhat less during the summer.

Reality has turned out somewhat differently from expectation. Cooperative programs have moved forward apace with activities

involving, or under discussion with, ESA, AUSSAT, and CRL (Japan) but the Information Center per se has had no hand in these activities. Uncovering future plans of government and industrial organizations, unless they have been published, is easier said than done. However, attendance at conferences is a good way to keep up with research that is already underway. The opportunity to contribute to the harmonizing and pooling of propagation data will logically take place at the ACTS Workshop planned for 4 to 8 months from now. However the Information Center can take pride in its contributions to the later three areas, as well as a few additional ones..

Activity

Since the initiation of the grant in July 1988 the NASA Propagation Information Center has:

- a) Produced four quarterly NASA Earth-Space Propagation Newsletters with an increasing demand with each edition [W. L. Flock].
- b) Carried out a review, proposed modification, and prepared the mailing list for the Ippolito handbook (Reference 2) [EKS].
- c) Travelled to San Jose in October, 1988 to make initial preparations for NAPEX XIII and coordinated arrangements thereafter, working with JPL and NASA [EKS].
- d) Assisted JPL in the preparation of a significant aeronautical mobile satellite text for CCIR SG-5, and participated in the U.S. preparatory work in Study Group 6 [EKS].
- e) Organized and implemented a subject/author retrieval system for propagation references [WLF/LL].
- f) Provided support to CCIR USSG-5/6, URSI Commission F, and the IEEE Wave Propagation Standards Committee for their meetings in Boulder.
- g) Organized and coordinated a monthly Communications Policy Luncheon in Boulder.
- h) One of us (E. K. Smith) taught a course with David Hogg at the University of Colorado during the Spring Term on Earth Space Propagation using the Flock Handbook (2), in part as a way to identify errors and omissions; and he will teach a second course on Fundamentals of Propagation at CU in the fall with Kenneth Davies.

- i) One of us (E. K. Smith) organized and coordinated the reception and program (URSI session G1) in Boulder in January, 1989 in memory of Henry G. Booker, John A. Ratcliffe and Newbern Smith.

Some activity was curtailed due to medical problems of Professor Flock (endocarditis in December and January followed by open-heart surgery in April). Our one scheduled foreign trip during the first year would have taken Prof. Flock to ICAP'89, the Sixth International Conference on Antennas and Propagation, held at the University of Warwick, England, April 4-7, 1989. Fortunately several members of the NASA Propagation Program were in attendance so that a report on the conference could be prepared for the latest Newsletter.

Future Plans

Projected foreign travel during the second half of 1989 will take E. K. Smith to the second International Symposium on Antennas and Propagation (ISAP'89), Aug. 22-25, 1989 in Tokyo where he will give a paper and chair the Radio Meteorology session. He will also give an invited lecture to the International Satellite Communications Society headquartered in Tokyo and a talk on radio noise at the URSI Commission E Symposium on Environmental and Space Electromagnetics, Tokyo, September 4-6, 1989. He then hopes to continue on to Mainland China at personal expense where he has two invitations, one to visit Xidian University in Xi'an and the other, from the Radio Broadcast Bureau, to lecture. However, no word has come from the PRC since the June 4 Tienanmen Square massacre.

The NASA Propagation Information Center plans to continue the efforts started in the first year. In addition, more attention will be paid to the following during the upcoming year:

- 1) Obtaining feedback from users of the propagation program's products;
- 2) Assisting in the implementation of the Science Review Panel Recommendation #4 (NASA should take a leading role in the harmonizing and pooling of propagation data from relevant organizations by defining data acquisition/processing standards).
- 3) Upgrading our computer competence. A visiting scientist from Xidian University in the People's Republic of China had been expected to participate in this, but this plan may have to be revised.
- 4) Entering the latest version of the Flock Handbook (1) into Macintosh Microsoft Word or Works and adding in the corrections

which have come to our attention. The latest Ippolito Handbook (2) is already available on tape.

5) Initiating the referencing of pertinent papers on Earth-space propagation from other centers into our data base.

References

1) Flock, W. L., **Propagation Effects on Satellite Systems at Frequencies Below 10 GHz - A Handbook for Satellite Systems Design - Second Edition.** NASA Reference Publication 1108(02), December 1987.

2) Ippolito, L. J., **Propagation Effects Handbook for Satellite System Design - A Summary of Propagation Impairments on 10 to 100 GHz Satellite Links with Techniques for System Design - Fourth Edition.** NASA Reference Publication 1082(04), February, 1989.

Session 1

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